National Institute of Environmental Health Sciences

Impact of nitrogen and climate change interactions on ambient air pollution and human health

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Abstract:

Nitrogen oxides (NOx) are important components of ambient and indoor air pollution and are emitted from a range of combustion sources, including on-road mobile sources, electric power generators, and non-road mobile sources. While anthropogenic sources dominate, NOx is also formed by lightning strikes and wildland fires and is also emitted by soil. Reduced nitrogen (e.g., ammonia, NH3) is also emitted by various sources, including fertilizer application and animal waste decomposition. Nitrogen oxides, ozone (O-3) and fine particulate matter (PM2.5) pollution related to atmospheric emissions of nitrogen (N) and other pollutants can cause premature death and a variety of serious health effects. Climate change is expected to impact how N-related pollutants affect human health. For example, changes in temperature and precipitation patterns are projected to both lengthen the O-3 season and intensify high O-3 episodes in some areas. Other climate-related changes may increase the atmospheric release of N compounds through impacts on wildfire regimes, soil emissions, and biogenic emissions from terrestrial ecosystems. This paper examines the potential human health implications of climate change and N cycle interactions related to ambient air pollution.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution

Air Pollution: Allergens, Interaction with Temperature, Ozone, Particulate Matter, Other Air Pollution

Air Pollution (other): NOx

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cancer, Cardiovascular Effect, Developmental Effect, Morbidity/Mortality, Respiratory Effect

Cardiovascular Effect: Other Cardiovascular Effect

Cardiovascular Disease (other): cardiovascular mortality

Developmental Effect: Cognitive/Neurological, Reproductive

Respiratory Effect: Other Respiratory Effect

Respiratory Condition (other) : respiratory mortality

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Review

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content